

REMARKS/ARGUMENTS

Claims 1-28 have been resubmitted. Claims 1, 3, 7, 12, and 16 have been amended. Claims 29 and 30 have been canceled. New Claim 31 has been added.

Claims 29-30 have been rejected under 35 U.S.C. §102(b) as being anticipated by Stein (U.S. Patent No. 4,082,296). Claims 1, 2, 7, 8 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Glaser et al. (U.S. Patent No. 4,725,206) in view of Stein.

Claims 3-6 and 9-15 have been objected to as being dependent on rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 17-28 have been allowed.

Stein (U.S. Patent No. 4,082,296)

The Stein reference describes a liquid-to-air seal produced by a carbon hydrodynamic seal. The seal produces a liquid or film which is the force that maintains carbon contact of the seal with a shaft rotating surface. This contact addresses hydrodynamic skating that can cause excessive leakage of fluid due to loss of contact.

In contrast, the rotor of the present invention comprises a hydrodynamic carbon bearing/seal which forms an air-to-air seal as well as acts as a bearing in combination with an air foil bearing. The Stein reference does not teach nor suggest that the carbon hydrodynamic seal function as a bearing. Moreover, the Stein reference does not teach or suggest the present invention, specifically

a rotor comprising *both* an air foil bearing and a carbon hydrodynamic seal where the foil bearing and carbon hydrodynamic seal operate in combination.

Claims 29 and 30 have been rejected under 35 U.S.C. §102(b) as being anticipated by Stein. In an effort to expedite prosecution of this case, but in no way conceding to the validity of the rejection, Claims 29 and 30 have been canceled. Therefore, the rejection of claims 29 and 30 is moot.

Glaser et al. (U.S. Patent No. 4,725,206)

The Glaser reference describes a rotor having a slinger which acts as an air spray showerhead between an air foil bearing and a hot turbine wheel. The function of this slinger is strictly to prevent turbine heat from getting into the foil bearing. The reference further describes a labyrinth seals on both the compressor side and turbine side of the wheel assembly for retaining cooling gases.

In contrast, the rotor of Claim 1 comprises air foil bearings and hydrodynamic carbon seal/bearings where the hydrodynamic carbon seal/bearings seal the bearing compartment, increasing the internal operating pressure of the air foil bearing, resulting in increased load capacity of the air foil bearing. Additionally, the hydrodynamic carbon seal/bearings also act as bearings in combination with the air foil bearing. The air-to-air seal causes an increased internal operating pressure, increasing the foil bearing load carrying capacity.

The Glaser reference does not teach the carbon hydrodynamic seal/bearings of the present invention either alone or in combination with an airfoil bearing. Nor would the skilled artisan be motivated to combine the carbon hydrodynamic seals of the Stein reference with the rotor of the Glaser

reference to produce the present invention. The substitution of the labyrinth seals of the Glaser reference with the carbon hydrodynamic seals of the Stein reference would still not produce the present invention as the labyrinth seals of the Glaser reference are not positioned for increasing the internal operating pressure of the foil bearings. Moreover, there is no motivation in either reference or in the art, to combine the carbon hydrodynamic seals of the Stein reference with the labyrinth seals of the Glaser reference to produce the rotor of the present invention. Therefore, each of Claims 1 and 2 defines an invention which is unobvious over Glaser in view of Stein. Withdrawal of the rejection of Claims 1 and 2 is therefore respectfully requested.

Additionally, in an effort to expedite prosecution of this case, but in no way conceding to the validity of the rejection, Claims 7 and 16 have been amended so that Claims 7, 8 and 16 are now dependent on amended Claim 3. Claim 3 was objected to as containing allowable subject matter but being dependent on rejected base Claim 1. Claim 3 has been amended to include the limitations of Claims 1 and 2. Thus, independent amended Claim 3 is allowable, and therefore Claims 7, 8 and 16 which are dependent from claim 3 are also allowable. Withdrawal of the rejection of Claims 7, 8 and 16 is therefore respectfully requested.

Claims Objected to

Claims 3-6, 9-15 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. As noted above, Claim 3 has been amended to be in independent form, and to contain all of the limitations of Claims 1 and 2. Original claims 4-6, 9-11, and 13-15 are now dependent on amended Claim 3. In addition, Claim 12 has been amended to be dependent on amended Claim 3. Thus, each of claims 4-6 and

9-15 is directly or indirectly dependent from allowable claim 3 as amended. Applicant therefore respectfully requests withdrawal of the objection.

New Claim

New Claim 31 has been added. New Claim 31 contains all the limitations of objected to Claim 12 and base Claim 1. Therefore, allowance of Claim 31 is respectfully requested.

CONCLUSION

Reconsideration and withdrawal of the Office Action with respect to Claims 1-16 is respectfully requested.

In the event the examiner wishes to discuss any aspect of this response, please contact the attorney at the telephone number identified below.

Respectfully submitted,

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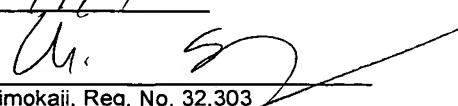
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